UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,957	02/20/2004	John K. Fraser	CYTH.002CP1	4824

20995 7590 09/30/2008

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
KIM, TAEYOON	

ART UNIT	PAPER NUMBER
1651	

NOTIFICATION DATE	DELIVERY MODE
09/30/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
eOAPilot@kmob.com

Office Action Summary	Application No.	Applicant(s)	
	10/783,957	FRASER ET AL.	
	Examiner	Art Unit	
	TAEYOON KIM	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,6-28 and 83-86* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,6-28 and 83-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :7/25/08, 5/20/08, 2/6/08, 11/28/07, 10/22/07, 10/17/07, 3/24/06, 6/6/05.

DETAILED ACTION

Claims 1, 2, 4, 6-28 and 83-86 are pending.

Election/Restrictions

Applicant's election without traverse of ischemia for type of injury/damage treated, stem cells for type of cells administered, and placental growth factor (PlGF) as elected species in the reply filed on 4/4/2008 is acknowledged. Upon further consideration, it is decided that the requirement of species election for a specific gene to be transferred (applicant elected PIGF as a species) is no longer necessary and thus withdrawn.

Claims 3, 5 and 29-82 have been cancelled, claims 83-86 have been newly added, and claims 1, 2, 4, 6-28 and 83-86 have been considered on the merits.

Information Disclosure Statement

The information disclosure statement filed 10/22/2007 contains a list of office actions for the various applications related to the current application (cite no. 113-134). However, the IDS fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. Particularly, M.P.E.P. §609.01 (B)(2)(d) indicates the requirement of copies for all information cited (e.g. an affidavit and office action) other than the specification, including claims and drawings, of a pending U.S. application. It has been placed in the application file, but the cited references referring the office actions have not been considered.

Priority

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 60/338,856, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. The '856 application fails to disclose a method for restoring blood flow in a subject having an ischemic condition. Therefore, the benefit of earlier filing date is granted only to the filing date of Application no. 10/316,127, which is 12/9/2002.

Drawings

The drawings are objected to because Figure 6 is invisible. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief

description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claims 16-19 disclose the cell population comprising adipose-derived stem cells being grown in culture conditions that promote differentiation towards a myocytic phenotype, and the myocytic phenotype being cardiac, skeletal or vascular smooth muscle myocytic phenotype. There is no adequate description in the specification of the limitations claimed in the current claims.

Claim 28 discloses a limitation drawn to the modification results in alteration of the homing properties of the concentrated population of cells comprising adipose derived stem cells. There is no proper antecedent basis in the specification.

Claim Objections

Claims 1 and 83 are objected to because of the following informalities: There is a typographical error in claim 1, line 1. The article “an” is supposed to be “a” instead.

Claim 83 has a typographical error in the term "angiogeneis". It should be "angiogenesis". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 recites the limitation "the patient" in line 3. There is insufficient antecedent basis for this limitation in the claim.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 16-19 and 26-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 16-19 are drawn to the cell population comprising adipose-derived stem cells being grown in culture conditions that promote differentiation towards a myocytic phenotype, and the myocytic phenotype being cardiac, skeletal or vascular smooth muscle myocytic phenotype.

Claims 26-28 are drawn to the limitations that the cell population comprising adipose-derived stem cells being modified by gene transfer of a gene to alter the level of apoptosis or homing properties.

The current application generically claims any culture condition promoting myocytic differentiation of adipose-derived stem cells (claims 16-19) or any gene altering the level of apoptosis or homing properties (claim 26-28).

However the specification does not contain an adequate description for the entire scope of this limitation and thus the claims. The claims are not limited to a particular species just generically any culture conditions promoting myocytic differentiation of adipose-derived stem cells, or any gene altering the level of apoptosis or homing properties. The specification does not provide any single example for the culture condition for the desired phenotype or genes altering the level of apoptosis or homing properties.

The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. See Eli Lilly, 119 F.3d at 1568,43 USPQ2d at 1406.

Every species in a genus need not be described in order that a genus meets the written description requirement. See Utter, 845 F.2d at 998- 99,6 USPQ2d at 1714 ("A

specification may, within the meaning of §112, first paragraph, contain a written description of a broadly claimed invention without describing all species that claim encompasses.") In claims to a species from a genus, however, a generic statement without more, is not an adequate written description of the genus because it does not distinguish the claimed species of the genus from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function, does not suffice to define the genus because it is only an indication of what the genus does, rather than what it is. See Fiers, 984 F.2d at 1169-71, 25 USPQ2d at 1605- 06 (discussing Amgen). It is only a definition of a useful result rather than a definition of what achieves that result. Many such species of the genus may achieve that result. The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See In re *Wilder,* 736 F.2d 1516, 1521, 222 USPQ 369,372- 73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outline goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate."). Accordingly, naming a type of material generally thought to exist, in the absence of knowledge as to what that material consists of, is not a description of that entire material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
> This application currently names joint inventors.

In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4, 6-22 and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dengler et al. (Herz, 2002; IDS ref.) in view of Katz et al. (US 6,777,231; IDS ref.), Zuk et al. (2001; IDS ref.) and Miranville et al. (2004, Circulation; IDS ref.).

Dengler et al. teach a method of treating ischemic condition in a human patient suffering myocardial infarction (MI) by administering stem cells including adult stem cells, and endothelial precurosor cells (p.598, 601 and Fig. 1).

Dengler et al. teach injection routes of stem cells including intravenous, intravascular (administered to the subject's vasculature), intracoronory, intramyocardial injections/delivery (Fig. 1; p.602, right col.-p.603, left col.) (claims 13 and 14).

Dengler et al. does not teach adipose tissue-derived stem cells.

Katz et al. teach adipose-derived stem cells or a cell population comprising the stem cells, which have capability to differentiate into mesodermal tissues including various tissues of the heart (pericardium, epicardium, epimyocardium, myocardium,

pericardium, valve tissue, etc.), vascular epithelium, or muscle tissues (skeletal, cardiac, smooth muscles) (col. 2, lines 27-49) and their use in a method of promoting angiogenesis or neovascularization within tissue or facilitating the regeneration of tissues where the cells are implanted (col. 9, lines 38-47, col.10, lines 1-9). Katz et al. also teach adipose-derived stem cells from human adipose tissue (col. 2, lines 34-36).

It would therefore have been obvious for the person of ordinary skill in the art at the time the invention was made to use the adipose-derived stem cells of Katz et al. in the method of Dengler et al.

The skilled artisan would have been motivated to make such a modification because Katz et al. teach the capability of adipose-derived stem cells differentiating into myogenic lineage and possessing angiogenic/arteriogenic effects, and Zuk et al. also teach adipose-derived stem cells within processed lipoaspirate cells (PLA) in human adipose tissue, the adipose-derived stem cells possess a capability to differentiate into myogenic lineage and the adipose-derived stem cells can be an alternative source to bone marrow-derived mesenchymal stem cells (abstract). Therefore, the adipose-derived stem cells of Katz et al. are suitable alternative to the cells used in the method of Dengler et al. in repairing myocardial infarction.

M.P.E.P. §2144.07 states “The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) (Claims to a printing ink comprising a solvent having the vapor pressure characteristics of butyl carbitol so that the ink would not dry at room temperature but would dry quickly

upon heating were held invalid over a reference teaching a printing ink made with a different solvent that was nonvolatile at room temperature but highly volatile when heated in view of an article which taught the desired boiling point and vapor pressure characteristics of a solvent for printing inks and a catalog teaching the boiling point and vapor pressure characteristics of butyl carbitol. “Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle.” 325 U.S. at 335, 65 USPQ at 301.)”.

With regard to the limitation of "concentrated cell population”, the limitation is interpreted as purified cell population. Since Katz et al. teach the process obtaining adipose-derived stromal stem cells involving isolation and clonal expansion, etc. (col. 3, line 8 through col.4, line 59), these cells are inherently considered as a concentrated cell population.

With regard to the limitation that the concentrated cell population further comprising adipose-derived progenitor cells, it is an inherent property of the adipose cell population derived from adipose tissue contain not only stem cells (adipose-derived stem cells) but endothelial progenitor cells as evidenced by Miranville et al. Miranville et al. teach the stroma-vascular fraction of human adipose tissue contains endothelial progenitor cells, and thus adipose tissue is a source of stem/progenitor cells (abstract).

With regard to the limitations to the administration of the composition in multiple doses or in a bolus (a single large dose) in claims 8 and 9, the references are silent about the limitation. However, since it is well known in the art that biological materials such as cells can be injected in a bolus or in a multiple dose, the frequency and the

amount of injection of cell composition in the cell transplantation therapy can be optimized by a skilled person in the art upon the design of procedure, it would have been obvious to a person of ordinary skill in the art to routinely optimize the frequency and dosage of cells to be administered based on the needs in the procedure, or to obtain desirable outcome from the procedure. It is well settled that routine optimization is not patentable, even if it results in significant improvements over the prior art. In support of this position, attention is directed to the decision in *In re* Aller, Lacey, and Haft, 105 USPQ 233 (CCPA 1955).

With regard to the limitation drawn to the cell composition comprising an angiogenic or an arteriogenic factor (claims 10 and 11), Katz et al. teach that the adipose-derived stem cells secrete an angiogenic hormone such as vascular endothelial growth factor (VEGF) (col. 9, lines 38-47). The terms of “arteriogenic” and “angiogenic” are considered as the same. Therefore, the cell population of adipose-derived stem cells of Katz et al. inherently comprises an angiogenic/arteriogenic factor such as VEGF.

With regard to the limitation drawn to the composition further comprising immunosuppressive drugs in claim 12, Dengler et al. suggest that the recipients of cellular transplant would require some form of immunosuppression (p.604, left col.). Furthermore, it is extremely well known in the art that the use of immunosuppressive drugs in transplanting cells, tissues or organs derived from allogeneic sources. Therefore, the use of immunosuppressant drugs is a well known option to be used in the field of transplantation, and it would have been obvious to a person of ordinary skill

in the art to try immunosuppressant drugs to alleviate any potential immune response caused by administered stem cells of the references. See KSR v. Teleflex (550 US82 USPQ2d 1385, 2007). See also M.P.E.P. §2141.

With regard to the limitation to the adipose derived stem cells being cultured prior to administration toward myocytic or endothelial phenotype, and to the limitations to the myocytic phenotype being cardiac, skeletal, or vascular smooth muscle (claims 15-20), Katz et al. teach the adipose-derived stem cells can be expanded in culture (abstract), and a procedure of conditioning adipose-derived stem cells by culturing them in culture media that has been conditioned by exposure to mature cells of the respective type to be differentiated. For example, myogenic differentiation can be promoted by using a medium conditioned by exposure to myocytes (col. 4, line 66 through col. 5, line 6). Furthermore, Katz et al. teach that adipose-derived stem cells have capability to differentiate into skeletal, cardiac or smooth muscle (col. 2, lines 47-48). Therefore, the myogenic phenotypes (i.e. cardiac, skeletal or vascular smooth muscle) as claimed in the invention can be achieved by exposing the adipose-derived stem cells in conditioned media of cardiac, skeletal or vascular smooth muscle cells. The selection of these types of cells used for conditioned media is solely dependent on the target tissue for the method to be used. Therefore, a person of ordinary skill in the art would have routinely optimized the procedure to culture adipose-derived stem cells in different types of cells respective to the target tissue where the stem cells to be administered.

Still further, since Dengler et al. teach endothelial precursor cells or angioblasts can be used for neovascularization of infarcted myocardium (p.605, right col.), Katz et

al. teach the capability of the adipose-derived stem cells to differentiate into hemangial tissue such as vascular epithelium (col. 2, lines 46-47) and Miranville et al. teach the presence of a cell population having characteristics of endothelial progenitor cells in adipose tissue (abstract), it would have been obvious to a person of ordinary skill in the art to try to differentiate the endothelial progenitor cells and/or adipose-derived stem cells present in the adipose tissue in culture towards an endothelial phenotype to induce neovascularization in a subject having a MI.

With regard to the limitation of claims 21 and 22, drawn to the cell culture on a 3-dimensional resorbable scaffold, Katz et al. also teach a 3-dimensional biodegradable lattice such a mesh or sponge for growing adipose-derived stem cells or cell population (col. 10, lines 9-18 and 27-50).

With regard to the limitations in claims 83-86, the "wherein" clause of the claims merely states the result of the limitations in the claims and therefore, adds nothing to the patentability or substance of the claim. Therefore, this phrase does not limit the claim. See *Texas Instruments Inc. v. International Trade Commission*, 26 USPQ2d 1010 (Fed. Cir. 1993); *Griffin v. Bertina*, 62 USPQ2d 1431 (Fed. Cir. 2002); *Amazon.com Inc. v. Barnesandnoble.com Inc.,* 57 USPQ2d 1747 (Fed. Cir. 2001).

Nevertheless, Dengler et al. teach that cell therapy using various types of cells including adult stem cells would result in angiogenesis/arteriogenesis (p.605, right col.), inhibition of apoptosis (p.605, right col.) and inhibition of scar formation (p.601, left col.) in the MI. Furthermore, as mentioned above, Katz et al. teach that the adipose-derived stem cells secrete an angiogenic hormone such as vascular endothelial growth factor

(VEGF) (col. 9, lines 38-47). Thus, the intended results of the claims 83-86 are inherently met by the method of Dengler et al. in view of Katz et al. and Zuk et al.

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

Claims 1 and 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dengler et al. (supra) in view of Katz et al. (supra) and Zuk et al.(supra) in further view of Luft et al. (US 2003/0152558), Rehman et al. (2004, Circulation) and Hur et al. (2007, Stem Cells).

Dengler et al. in view of Katz et al. and Zuk et al. teach the limitation of claim 1 (see above).

Dengler et al. in view of Katz et al. and Zuk et al. do not teach the cell composition comprising an angiogenic or an arteriogenic factor.

Dengler et al. in view of Katz et al. and Zuk et al. do not teach gene transfer of a gene to modify adipose derived stem cells to alter the level of angiogenesis, arteriogenesis or apoptosis.

Luft et al. teach genetically engineered adipose-derived stromal cells, which inherently comprise adipose-derived stem cells, to express protein such as VEGF (para. 23).

It would therefore have been obvious for the person of ordinary skill in the art at the time the invention was made to try genetically modification of the adipose-derived stem cells of Dengler et al. in view of Katz et al. and Zuk et al. to express VEGF in higher amount.

The skilled artisan would have been motivated to make such a modification because Dengler et al. teach ex vivo processing including cell culture and genetic modification of cells prior to the transplantation for treating myocardial infarction (Fig. 1), and Rehman et al. teach the benefit of VEGF as angiogenic and anti-apoptotic factor, a person of ordinary skill in the art would recognize that the method of repairing damaged ischemic tissue using adipose-derived stem cells of Dengler et al. in view of Katz et al. and Zuk et al. along with VEGF engineered to be secreted in higher amount from the adipose-derived stem cells would facilitate the angiogenesis and arteriogenesis, and thus alter the level of angiogenesis, arteriogenesis and apoptosis.

The person of ordinary skill in the art would have had a reasonable expectation of success in genetically engineering adipose-derived stem cells since the technique of genetic engineering is well known in the art as taught by Luft et al. and the effect of VEGF in angiogenesis/arteriogenesis/anti-apoptosis is known in the art as taught by Rehman et al.

With regard to the intended result of alteration of the homing properties of the cell population, Hur et al. teach that VEGF has an intrinsic capability to enhance homing property of endothelial progenitor cells (abstract). Therefore, the secretion of VEGF by a genetic engineering as taught by Luft et al. would also inherently enhance the homing properties of the stem cells of adipose tissues.

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAEYOON KIM whose telephone number is (571)272-9041. The examiner can normally be reached on 8:00 am - 4:00 pm ET (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Taeyoon Kim/
Examiner, Art Unit 1651